



South Delta IMPROVEMENTS PROGRAM

Action Specific Implementation Plan



California Department
of Water Resources



U.S. Department of the Interior,
Bureau of Reclamation

June 2006

U.S. Department of the Interior, Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

California Department of Water Resources

The mission of the California Department of Water Resources is to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

South Delta Improvements Program Action Specific Implementation Plan

Prepared for:

U.S. Department of the Interior, Bureau of Reclamation,
and the
California Department of Water Resources

Prepared by:

Jones & Stokes
2600 V Street
Sacramento, CA 95818-1914
Contact: Harry Oakes
916/737-3000

June 2006

Jones & Stokes. 2006. *South Delta Improvements Program action specific implementation plan*. June. (J&S 02053.05.) Sacramento, CA.

Contents

	Page
Chapter 1	
Introduction.....	1-1
1.1 Purpose of the ASIP	1-1
1.2 Terminology	1-2
1.3 Description of the South Delta Improvements Program.....	1-4
1.4 Related Consultation and Analysis	1-5
1.4.1 OCAP Early Consultation.....	1-5
1.4.2 Dredging and Extension of Agricultural Diversions	1-6
1.5 Summary of Stage 1 Implementation.....	1-7
1.6 South Delta Improvements Program Implementing Entities	1-7
1.7 Relationship of the SDIP ASIP to the CALFED Programmatic Documents	1-7
1.8 SDIP ASIP Process	1-8
1.9 Selection of ASIP-Covered Species	1-9
1.10 Critical Habitat.....	1-10
1.10.1 Current Critical Habitat Designated by NOAA Fisheries and USFWS	1-10
1.10.2 Proposed Critical Habitat by NMFS	1-11
1.11 Essential Fish Habitat	1-11
1.12 Selection of Natural Communities.....	1-12
1.13 ASIP-Covered Species Goals.....	1-12
1.14 Summary of Impacts on ASIP-Covered Species and Natural Communities	1-13
1.15 Organization of This Report	1-13
1.16 Note about Units Used in This Report	1-15
Chapter 2	
Project Description.....	2-1
2.1 Introduction	2-1
2.2 Consultation History.....	2-1
2.3 Project Construction Details.....	2-1
2.3.1 Gate Construction	2-2
2.3.2 Gate Operations.....	2-8
2.3.3 Dredging.....	2-13
2.4 Environmental Commitments.....	2-17
2.4.1 Conservation Measures	2-17
2.4.2 Best Management Practices	2-19

Chapter 3	Approach to Impact Assessment and Development of Conservation Measures to Avoid, Minimize, and Compensate for Impacts.....	3-1
3.1	Baseline for Endangered Species Act Consultation	3-1
3.2	Impact Mechanisms	3-3
3.3	Methods to Assess Project-Related Impacts	3-4
3.3.1	Gate Operations.....	3-4
3.3.2	Construction-Related Impacts.....	3-7
3.3.3	Overview of Permanent and Temporary Impacts.....	3-9
3.3.4	Overview of Impact Assessment Methods for ASIP-Covered Fish Species	3-11
3.3.5	Overview of Impact Assessment Methods for ASIP-Covered Wildlife Species.....	3-14
3.3.6	Overview of Impact Assessment Methods for ASIP-Covered Plant Species	3-14
3.4	Assessment of Impacts on Natural Habitats	3-16
3.4.1	Natural Community Surveys	3-16
Chapter 4	Natural Community Assessment and Conservation Measures	4-1
4.1	Introduction	4-1
4.1.1	Definition of SDIP Study Area and Project Area	4-2
4.1.2	Natural Community Surveys	4-2
4.2	Relationship to the CALFED Programmatic EIS/EIR	4-3
4.3	Anadromous and Estuarine Fish Species.....	4-4
4.4	Natural Communities	4-4
4.5	Tidal Perennial Aquatic Habitat.....	4-4
4.5.1	Status in the Study Area	4-4
4.5.2	Project Impacts	4-6
4.5.3	ASIP Conservation Measures	4-8
4.5.4	Expected Outcomes	4-8
4.6	Tule and Cattail Tidal Emergent Wetland	4-8
4.6.1	Status in the Study Area	4-8
4.6.2	Project Impacts	4-10
4.6.3	ASIP Conservation Measures	4-13
4.6.4	Expected Outcomes	4-13
4.7	Valley/Foothill Riparian Community.....	4-14
4.7.1	Status in the Study Area	4-14
4.7.2	Project Impacts	4-17
4.7.3	ASIP Conservation Measures	4-20
4.7.4	Expected Outcomes	4-21
4.8	Upland Cropland	4-21
4.8.1	Status in the Study Area	4-21
4.8.2	Project Impacts	4-22
4.8.3	ASIP Conservation Measures	4-23
4.8.4	Expected Outcomes	4-24

Chapter 5	Assessment of Project Impacts on ASIP-Covered Species and Conservation Measures	5-1
5.1	Introduction	5-1
5.1.1	Definition of SDIP Study Area and Project Area	5-2
5.2	Relationship to the CALFED Programmatic EIS/EIR	5-2
5.3	U.S. Fish and Wildlife Service—Covered Species	5-3
5.3.1	San Joaquin Kit Fox	5-3
5.3.2	Riparian Brush Rabbit	5-8
5.3.3	Giant Garter Snake	5-9
5.3.4	Delta Smelt	5-13
5.3.5	Valley Elderberry Longhorn Beetle	5-23
5.4	National Marine Fisheries Service—Covered Species	5-28
5.4.1	Central Valley Spring-Run Chinook Salmon Evolutionarily Significant Unit	5-28
5.4.2	Sacramento River Winter-Run Chinook Salmon Evolutionarily Significant Unit	5-32
5.4.3	Central Valley Steelhead Evolutionarily Significant Unit	5-36
5.4.4	Green Sturgeon	5-40
5.4.5	English Sole and Starry Flounder	5-47
5.5	California Department of Fish and Game—Covered Species	5-48
5.5.1	California Black Rail	5-48
5.5.2	Greater Sandhill Crane	5-52
5.5.3	Swainson's Hawk	5-53
5.5.4	White-Tailed Kite	5-58
5.5.5	Delta Smelt	5-63
5.5.6	Central Valley Spring-Run Chinook Salmon	5-63
5.5.7	Sacramento River Winter-Run Chinook Salmon	5-63
5.5.8	Delta Coyote-Thistle	5-63
5.5.9	Mason's Lilaeopsis	5-66
Chapter 6	Assessment of Cumulative Impacts	6-1
6.1	Introduction	6-1
6.2	Related and Reasonably Foreseeable Nonfederal Actions	6-2
6.2.1	Mountain House New Town	6-3
6.2.2	River Islands Development	6-3
6.3	Cumulative Impacts on ASIP-Covered Fish and Wildlife Species	6-3
6.3.1	Fish	6-3
6.3.2	Wildlife	6-5
6.4	Summary	6-6
Chapter 7	Monitoring Program	7-1
7.1	Types of Monitoring	7-1
7.2	Compliance Monitoring	7-2
7.2.1	Preconstruction Surveys	7-2
7.2.2	Construction Monitoring	7-3
7.2.3	Performance Monitoring	7-3
7.3	Effectiveness Monitoring	7-4
7.4	Reporting	7-4

7.5	Management and Monitoring of Conservation Easements for ASIP-Covered Species	7-5
7.6	Environmental Enhancements	7-5
7.7	Integrating Monitoring Results into the CALFED Monitoring Program	7-6
Chapter 8	Changed Circumstances, Remedial Measures, and Adaptive Management.....	8-1
8.1	Changed Circumstances and Remedial Measures.....	8-1
8.2	Adaptive Management.....	8-1
8.2.1	Existing Adaptive Management.....	8-1
8.2.2	SDIP ASIP Adaptive Management.....	8-2
Chapter 9	Funding Mechanisms.....	9-1
9.1	Funding Sources for SDIP	9-1
9.1.1	Cost of Implementing SDIP Conservation Measures	9-1
Chapter 10	Alternatives to Take Considered and Rejected	10-1
Chapter 11	List of Preparers	11-1
11.1	Department of Water Resources	11-1
11.2	Bureau of Reclamation	11-1
11.3	ASIP Team.....	11-1
11.4	Jones & Stokes	11-2
Chapter 12	References Cited	12-1
12.1	Printed References	12-1
12.2	Personal Communications	12-9
Appendix A	U.S. Fish and Wildlife Service Letter and Species List for the South Delta Improvements Program	
Appendix B	Species Accounts of ASIP-Covered Species with Potential to Occur in the Study Area	
Appendix C	NOAA Fisheries Memorandum Providing Guidance on Conferencing on Proposed Critical Habitat	
Appendix D	U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance	
Appendix E	California Department of Fish and Game Mitigation Guidelines for Swainson's Hawk	
Appendix F	California Department of Fish and Game Staff Report on Burrowing Owl Mitigation	
Appendix G	Scientific Names of Species Mentioned in This Report	

Tables

Folows Page

1-1	Species Assessed in the SDIP ASIP	1-2
1-2	Natural Communities Present in the SDIP Project Area.....on page	1-3
1-3	Special-Status Species with the Potential to Occur in the SDIP Study Area.....	1-10
1-4	Species That Are Proposed for Evaluation in the SDIP Project ASIP	1-10
1-5	Summary of Impacts on ASIP-Covered Species.....	1-14
1-6	Summary of Adverse Impacts and ASIP Conservation Measures for ASIP-Covered Species	1-14
1-7	Summary of Adverse Impacts and ASIP Conservation Measures for Natural Communities	1-14
2-1	Gate Fabrication and Construction Schedule.....on page	2-2
2-2	Dredging Detail	on page 2-17
2-3	Avoidance and Minimization Measures for ASIP-Covered Species and Natural Communities	2-18
2-4	Compensation and Mitigation Measures for ASIP-Covered Species and Natural Communities and Species.....	2-18
2-5	SDIP-Ranked Studies Related to Delta Fisheries Monitoring and Research Studies.....	2-18
3-1	Temporary Barriers Program Permits.....on page	3-2
3-2	73-Year Average Change in Delivery = Yield (thousand acre-feet)	on page 3-6
3-3	Project Actions, Specific Project Activities, and Impact Mechanisms under Implementation of the SDIP	3-8

3-4	Life Stages of ASIP-Covered Intertidal Plants	on page 3-15
3-5	ASIP-Covered Plants: Assumptions for Selected Environmental Correlates	on page 3-16
3-6	Environmental Correlates, Hypotheses, and Measures of Impacts for ASIP-Covered Intertidal Plant Species Response	3-16
4-1	Existing Land Cover Types in the SDIP Study Area and Project Area.....	4-2
4-2	Fish Species Groups and Associated Natural Community Habitat Types.....	on page 4-1
4-3	Land Cover Impacts Associated with Gate Construction and Dredging	4-6
5-1	ASIP-Covered Species	5-2
7-1	Types of Monitoring Potentially Required for ASIP-Covered Species and NCCP Communities.....	7-2
7-2	Preconstruction Surveys for ASIP-Covered Species and NCCP Communities.....	7-2
7-3	Avoidance and Minimization Measures for ASIP-Covered Species and NCCP Communities.....	7-4
7-4	Performance Monitoring Indicators and Success Criteria for Mitigation Measures	7-4
8-1	Changed Circumstances and Remedial Measures for ASIP-Covered Species and NCCP Communities.....	8-2
10-1	Alternatives to Take Considered and Rejected for Federally Listed and Proposed ASIP-Covered Species	10-1

Figures

Follows Page

1-1	SDIP Study Area.....	1-4
2-1	Head of Old River Fish Control Gate	2-4
2-2	Middle River Flow Control Gate.....	2-6
2-3	Grant Line Canal Flow Control Gate.....	2-6
2-4	Old River at DMC Flow Control Gate.....	2-8
2-5	West Canal Dredge Area.....	2-14
2-6	Middle River Dredge Area	2-14
2-7	Old River Dredge Area	2-14
2-8	Middle River Spoils Ponds Locations	2-14
2-9	Settling Pond	2-14
2-10	Example of Hydraulic Dredging Operation	2-14
3-1	Geographic Area Affected by Changes in Stage	3-6
3-2	Cross Section of Monthly Preproject and Postproject Water Surface Elevation Changes	3-6
3-3	Conceptual Model for Assessment of SDIP Effects on Intertidal Plants	3-16

Acronyms and Abbreviations

µS/cm	microSiemens per centimeter
ASIP	Action Specific Implementation Plan
BA	biological assessment
Bay-Delta	San Francisco Bay/Sacramento–San Joaquin Delta Estuary
BMPs	best management practices
BO	Biological Opinion
°C	degrees Celsius
CALFED Program	CALFED Bay-Delta Program
CALFED ROD	CALFED Programmatic Record of Decision
CBDA	California Bay-Delta Authority
CCF	Clifton Court Forebay
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Conservation Agreement	CALFED Bay-Delta Program Multi-Species Conservation Strategy
Corps	U.S. Army Corps of Engineers
CVP	Central Valley Project
Delta	Sacramento–San Joaquin River Delta
DFG	California Department of Fish and Game
DMC	Delta-Mendota Canal
DO	dissolved oxygen
DWR	California Department of Water Resources
EC	electrical conductivity
EFH	essential fish habitat
EIR/EIS	environmental impact report/environmental impact statement
ERP	Ecosystem Restoration Program
ESA	federal Endangered Species Act
ESU	evolutionarily significant unit
EWA	Environmental Water Account

°F	degrees Fahrenheit
FR	Federal Register
GPs	general permits
GPS	global positioning systems
HM	habitat management
H-piles	Foundation piles
ISDP	Interim South Delta Program
mg/L	milligrams per liter
MSA	Magnuson-Stevens Act
MSCS	Multi-Species Conservation Strategy
Msl	mean sea level
NAVD	North American Vertical Datum
NCCP	Natural Community Conservation Plan
NCCPA	California Natural Community Conservation Planning Act
NEPA	National Environmental Policy Act
NGVD	national geodetic vertical datum
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOAA Fisheries Programmatic BO	National Marine Fisheries Service CALFED Bay-Delta Program Programmatic Biological Opinion
NWP	nationwide permits
OCAP	Operations Criteria and Plan
Programmatic BOs	USFWS and NOAA Fisheries Programmatic BOs
Programmatic EIS/EIR	CALFED Programmatic EIS/EIR
Programmatic NCCP	Natural Community Conservation Planning Act Approval of the CALFED Bay-Delta Program Multiple Species Conservation Strategy
Determination	
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RWQCB	Regional Water Quality Control Board
SAP	sampling and analysis plan
SDIP	South Delta Improvements Program
SDIP EIS/EIR	Draft South Delta Improvement Project Environmental Impact Statement/Environmental Impact Report
SDWA	South Delta Water Agency
SRA	shaded riverine aquatic
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service
USFWS Programmatic BO	U.S. Fish and Wildlife Service Programmatic Biological Opinion on the CALFED Bay-Delta Program
USGS	U.S. Geological Survey
VELB	valley elderberry longhorn beetle